

active immunity had been proved by intrapleural inoculation was found to vary in tropin content of from five to eighty times that of normal rabbit serum. Satisfactory precipitin reactions were obtained by the immune serums used for therapeutic purposes, the antigens consisting of extracts of ground and dried streptococci. It was shown that the immune sera which contained strong antibodies may have a preventive and curative action when given before, with and after the infecting intrapleural dose of bacteria. Attempted vaccine therapy of the localized empyema gave consistently negative results. The authors conclude that although distinct results in the prevention of experimental empyema and, in rare instances, the cure of empyema may be produced by the use of immune serum from rabbits, they have, as yet, no evidence of a sovereign or even encouraging serum therapy to offer and that no optimistic conclusions can be drawn from their results as to the possibility of protecting human beings against localized streptococcus infections or, specifically, against empyema, owing to the large amount of vaccine and the prolonged nature of treatment required.

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**Experimental Streptococcus Empyema; Eleven Attempts at Dye Therapy.**—An interesting attempt to develop the value of dye therapy in the treatment of localized infections is described by GAY and MORRISON (*Jour. Inf. Dis.*, 1921, xxviii, 1) wherein the workers are eventually forced to conclude that "there is little certainty of the ultimate usefulness of dyestuffs as disinfectants in actual bacterial infections." The opportune availability of the pleural cavity for localized infections and the ready accessibility for any indicated subsequent manipulation were well known to the investigators so that their principal interest lay in developing an indisputable method for demonstrating the efficacy of the dyes in combating definite bacterial infection. Rabbits were the animals chosen for experimental purposes and these were injected intrapleurally with streptococci as the needs of the experiments required. The disinfectant and bacteriostatic effects of various dyes were tested out *in vitro*, not only upon the strains of streptococci but also upon *B. typhosus* and *staphylococcus*. It was shown by these means that streptococci succumb much more readily to the action of any one of a long series of dyes than does *B. typhosus* or even *staphylococcus* and that the most actively inhibitory dyes came from the triphenyl-methane and acridine groups. This was true to a lesser degree when the dyes were introduced into tubes of active pus removed from involved thoracic cavities. But when introduced into the pleural cavities of living animals suffering from empyema the sterilizing powers of the dye, in dosage and concentration many times that employed *in vitro*, were insignificant and readily offered the menace of toxic action from the dye itself. It may be that the dye inhibits or kills many of the organisms but probably some are held deep in the meshes of the fibrin and these subsequently proliferate. This latter hypothesis presents because there is no reason to believe that the organisms became dye-fast. As correlative problems, the authors proved that acriflavine, the most potent dye against streptococci, does, in strong concentration inhibit phagocytosis and that the reaction upon bacterial culture is the same in the presence as in the absence of oxygen, thereby eliminating a ques-

tionable feature in the intrapleural use of the dye. The value of the dye as an adjuvant to immune serum is of such insignificant quantity as to render it almost totally impractical.

**The Experimental Transmission of Encephalitis Lethargica to a Monkey.**—Following the production of a hemorrhagic encephalitis in a monkey by V. Wiesner and of epidemic encephalitis by Strauss, Hirshfeld and Loewe in both monkeys and rabbits with brain emulsions and nasopharyngeal secretions, McINTOSH and TUNNBULL (*British Jour. Exp. Path.* 1920, i, 89) reported the successful transmission of encephalitis lethargica to a Patas monkey after more or less indifferent results were obtained when material from eight fatal cases was inoculated into monkeys. In the present experiments, filtered and unfiltered human brain emulsions, which had been immersed in 33 per cent. glycerin for fourteen days were injected intracerebrally and intraperitoneally. A *Macacus rhesus* monkey received the unfiltered emulsion and the Patas monkey the filtered. Although the rhesus monkey showed evidence of drowsiness in about two weeks after inoculation, no inflammatory lesions in the brain could be demonstrated on necropsy. The Patas monkey, however, recovered from the inoculation in a week, but several weeks later developed a severe fit, dying nine days later. The histological changes reproduced, in exaggerated form, the chief characteristics of human encephalitis lethargica. This consisted of inflammatory infiltration, confined to the areas chiefly affected in the human disease. An emulsion of the cord and basal nuclei of the Patas monkey were inoculated into three other monkeys, one of which was developing symptoms not unlike those of the Patas monkey. The results of the inoculation of brain emulsions, from the Patas monkey were further reported upon by McINTOSH (*British Jour. Exp. Path.*, 1920, i, 257). The one animal which showed symptoms, presented at autopsy acute inflammatory changes, consisting of glial proliferation, slight perivascular infiltrations of glial cells and lymphocytes as well as congestion, hyaline thrombi and multiple hemorrhages in the perivascular sheaths along with such degenerative changes as chromatolysis and protoplasmic vacuolation of the ganglion cells. Emulsions of the spinal cord and brain from this monkey were then inoculated under the dura and subcutaneously into two monkeys and three rabbits. One monkey showed no abnormal signs while the baboon appeared to be out of sorts nine days after inoculation, which condition persisted for a week and then disappeared. The animal died four months later, after a fit. Two of the rabbits presented choreiform movements. The brain sections of one of these showed a few small cellular infiltrations. At the same time a monkey, kept as a control with an inoculated monkey, developed symptoms identical with those of the inoculated animal. The author believes the spontaneous case is additional proof "that the successful transmission in series of experimental encephalitis to monkeys and rabbits has completed the experimental proof necessary to show that the disease is caused by a living virus."

**The Viability and Growth of *B. Typhosus* in Bile.**—Various workers have held conflicting views regarding the action of bile and bile salts